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Has Development of Safety Codes Helped Accident Prevention in Industry ?[1]

by

Cyril Ainsworth, *Assistant Secretary*
American Standards Association

The use of safety codes developed by the industries concerned as a basis for the work of state regulatory departments

Compensation laws have performed a great service to society in general through arousing interest in the prevention of accidents. True it is that what the injured worker needs at the moment of his trouble is prompt and adequate relief and then rehabilitation but the passage of workmen's compensation laws by many of the states has done more than merely give injured people temporary relief through schedules of compensation payments.

In spite of the pessimistic reports that have been issued year after year from many sources showing that accidents are constantly increasing, the interest which has been stimulated in accident prevention work has resulted in the development of effective programs that have stemmed the tide of industrial accidents to a remarkable degree. Complete success in the industrial field, however, has not been reached and much remains to be done.

Considerable time might be spent in analyzing the situation to determine who is to blame for this complete lack of success in our safety work but, for the purposes of this discussion, there seems to be one factor that stands out predominantly as a contributing cause. It is the fact that there has not yet been brought about a satisfactory meeting of minds of the employer and the man on the job. In many states accident prevention work is almost at a standstill because of this fact. Departments of Labor and Industrial Commissions have been unable to develop programs including the promulgation of safety codes because of the lack of understanding between employer and employee. Much of the responsibility for this condition must rest with the governmental agencies and the states that are not now active in the development of safety codes have either not seen the situation clearly or have failed to assume the proper responsibility and make a definite attempt to bring about this satisfactory meeting of minds.

The employer is definitely responsible for the selection, training, and supervision of the worker. He is responsible for the physical condition of the plant. He is responsible for seeing that the tools and equipment which he gives the employee are such that the employee can perform his duties safely. Safety of operation is a managerial problem and unless the employer fully accepts the responsibility, the blame for accidents rests upon him more than upon anybody else.

The man on the job, who should be most concerned but very often is not, must also bear part of the responsibility for the prevention of accidents. Regardless of what his feelings may be toward his employer for his possible lack of sympathy with the accident prevention movement, the employee has a tremendous responsibility in insuring that his own conduct is such that, through obedience to safety rules, through thoughtfulness for the safety of those working around him, as well as for his own safety, and through wholehearted cooperation in the working out of suitable plans for the removal of accident hazards and unsafe practices, he will be doing his part to keep his plant accident record clear.

Many agencies have been developed for the purpose of stimulating this interest on the part of the employer and employee and many other agencies or organizations are endeavoring to provide this stimulus as a part of some other service which they may be rendering but there is no organization that has a greater opportunity for bringing about this satisfactory meeting of minds between employer and employee for the prevention of accidents than governmental agencies such as labor and industry departments and industrial commissions. The adoption of safety codes based on sound engineering practices; intelligent, unbiased, and thorough inspection service; and the conducting of intensive

[1] Presented at the Annual Convention of the International Association of Industrial Accident Boards and Commissions, Richmond, Va., October 8.

campaigns of safety education among both employers and employees present an opportunity possessed by no other group. The first of these activities is probably the most important and, therefore, the methods used in the development of safety codes should be very carefully analyzed.

Industry Should Create Codes

States, such as New York, Pennsylvania, Wisconsin, California, and several others that have been most successful in safety code development, have had as the key to the whole program the fundamental principle that the codes in reality should be created by industry itself. True it is that the governmental agency has made the necessary statistical and engineering investigations and possibly prepared the first tentative draft of the proposed code, but the plan from that point on has been to permit industry to thrash out its own differences and complete a standard that is acceptable to all. The plan for carrying this into effect has been to appoint a committee primarily of two groups; namely, employers and employees. In addition, the committees may include technical experts and representatives of the governmental agency who serve as advisors. In other words, the procedure has definitely brought together employer and employee. They sit around a common table where they can learn one another's ideas and desires and arrive at a mutual understanding and solution of the problem before them. Not only has this resulted in the development of a standard acceptable to the industry and the ensuing removal of accident hazards, due to the application of the specifications of the standard throughout the industry, but it has brought about a better general understanding in all employer-employee relations. One particular case where safety code development definitely achieved this result comes especially to mind. The textile manufacturers in one section of the country had been successful in blocking the development of a standard for many years. They felt that the only demand for a standard came from a group of employees generally considered as agitators and that the development of a standard was simply an opening wedge for other demands. The governmental agency, with considerable diplomacy, was successful in bringing together for a general discussion of the problem representatives of both groups. It so happened that the representatives of the employees were men whom the employers considered as being the leaders of the strongest group of agitators but, instead of continuing to oppose one another's ideas, the two groups learned to respect one another tremendously and out of that relationship in the development of the safety standard there grew a better understanding of all the problems which had been keeping the industry in a state of unrest for years. Little or no accident prevention work had been carried on in the industry prior to the development of the standard but its promulgation brought about a concerted effort for the prevention of accidents that had been almost entirely lacking before.

Not only has the committee work been of great value in stimulating better understanding but another phase of the plan of development, which covers the distribution of the proposed standard for purposes of general criticism by correspondence or public hearing, is also very important. Particularly is this true in the case of public hearings. Employer and employee present their criticisms of the proposed standards to the regulatory body in public. Their differences of opinion are thoroughly ironed out through the medium of the free discussion afforded by the public hearing. The members of the committee which prepared the standard, including both employers and employees, attend the hearings and give definite evidence to the public that it is possible for the two groups to get together in the common interest of prevention of accidents and reach an agreement in the form of a standard of safe practices which they will be required to live up to.

The use of such a procedure by governmental agencies in the development of standards of safe practice, based on the experience of industry, is bound to bring, in the estimation of plant managers and employees as a whole, a higher rating of government work. The use of a definite group of specifications by inspectors in making recommendations for removal of hazards creates a far better impression than the haphazard methods resulting from the use of individual opinions. The question of inspection procedure for the proper application of safety standards is a subject in itself but this much can be said: If the inspectors will work as trained advisors and represent an enlightened and a thoughtful departmental program they will become valuable safety factors. The development of a group of safety standards based on sound engineering practice is undoubtedly a great help to this type of public official.

This sound plan of development of safety codes which has been followed by many governmental agencies has had the very definite result of encouraging industry to police itself in accident prevention work. The development of American Standard Safety Codes is based on this principle, and the procedure under which uniform safety codes are developed is based entirely on the one which has been outlined as the procedure followed by the states which have been most successful in their acci-

dent prevention work. The progress made in creating uniform safety codes gives strong testimony of the success of this procedure.

The American Standard safety code program definitely represents an advanced step in making safety code procedure a more effective instrument in accident prevention work. There is nothing mysterious about the development of uniform safety codes. No attempt is being made to usurp the prerogatives of governmental agencies. The idea is not an attempt on the part of industry to quiet down the demands being made upon it for greater activity in the accident prevention movement. The results already obtained give definite proof of the success of the program.

Much has been written on the way in which ASA has proceeded in making uniform safety codes instruments toward the success of the accident prevention movement and it is unnecessary to repeat this information here. It might be well, however, to discuss the situation with reference to the use of the program by governmental agencies.

Some of the states have not been given legislative authority to develop and administer safety codes in their accident prevention work; while others, even though granted this authority, are working under budgets that do not permit the retaining of the staff necessary to carry on such work. In such cases the state agency has to be satisfied with attempting to apply the provisions of the general factory aw under which it functions. In most cases such laws are not specific and are couched in most general terms. This leaves the door wide open for the use of individual opinion on the part of the inspectors which may, or may not, be based on sound practice.

To such states the American Standard Safety Codes can be of very definite service. The lack of definite statutory authority for the administration of safety codes does not mean that the state must remain inactive and perform only a part of its possible service to industry. The fact that its laws are written in general terms immediately suggests the advisability of the use of a group of standards as a means of applying the provisions of the law and as an authoritative source of information to which the inspectors may go when making recommendations. The American Standard Safety Codes offer just such a group of specifications—specifications that have been prepared after a full opportunity has been afforded everyone in any way interested to assist in their development. The use of such a group of specifications cannot help but stimulate accident prevention work in states where the governmental agency has been active to only a moderate degree for the reasons that have been cited.

To the states that have full legislative authority and sufficient funds to carry on an active accident prevention program, the use of uniform safety codes as the basis of their safety standards presents some concrete advantages. For instance, they contain specifications based on a broader point of view than is possible through purely local action. The development of any group of safety standards should be from the point of view that they must be effective and acceptable to both industry and the state, and to make them so, whether from the local or national point of view, every possible source of information and criticism should be obtained. There is the advantage of making use of the national committee as a source of advice on matters of interpretation and application of the specifications. Some states are now availing themselves of this particular service.

Nation-Wide Uniformity Important

Of considerable importance to all states is the definite improvement that will come through an extensive use of the uniform codes in the type of guards for mechanical equipment furnished by the manufacturer of the equipment. This improvement cannot be expected until such time as a fair degree of uniformity exists in the standards of the various governmental agencies. This is of tremendous importance, particularly to the small sized industrial plant which resents the necessity of spending additional sums of money whenever new equipment is purchased.

Time does not permit discussion of other advantages in the use of American Standard Safety Codes, but before closing brief mention of the desirability of a more intimate cooperation by the states in the development of national codes might be worth while.

How to develop more adequate representation of the states in the development of national safety codes is a matter for decision by the International Association of Industrial Accident Boards and Commissions or the Association of Governmental Officials in Industry. It is hoped that they will be able to make progress in this direction, but whatever criticism of national codes the states may have, part of the responsibility for the facts presented by the criticism must rest with the states themselves. It has been the established policy that governmental agencies can have representation on the technical committees preparing standards. The fact is, however, that less than a dozen states have borne the burden of presenting the labor department point of view. In many cases the representatives of these states have been hampered by lack of funds or multiplicity of duties in attending meetings of committees or giving the subject the attention it deserves.

The result has been that, while the representatives of the states have served with fidelity, they have found it necessary to present personal points of view rather than the collective point of view of the states. This problem deserves your serious consideration.

Safety code procedure, whether viewed from the local or national point of view, has been effective in the prevention of accidents. Whether it will be of greater effectiveness in the future depends largely on the extent to which it is applied by governmental agencies. It is the one effective instrument that has been developed for bringing together the two great branches of industrial life, employers and employees, for the common solution of a problem that is a terrible blight on our industrial and social structure. May we hope, therefore, for a more complete study of the procedure not only by the states that have not used it in their accident prevention work, but also by those who have assisted in its development, with the object of improving the procedure in order to speed the day when greater success in our accident prevention programs may be assured.

Standard Conveying Systems Lower Equipment Costs

The need for standardization of conveying equipment is described in an article by Alex. R. Pribil, president of the Saginaw Stamping and Tool Company, Saginaw, Michigan, published in the April, 1931, issue of Materials Handling and Distribution. The following is an abstract of the article:

What are American equipment standards and how did they originate? The railroad industry probably gives the simplest illustration and answers the question in the most direct manner.

In the early days of railroading, each line had its own standards in rolling stock, track gage, etc. When these individual lines were brought together into extensive systems, common standards had to be established, in order that all equipment might be used anywhere on the system.

A similar evolution is taking place pretty much throughout all industry and is particularly noticeable in the comparatively new field of materials handling. Here again at the outset, equipment took a multitude of forms with innumerable sizes. Overhead trackage was built from every size of I-beam from three inches to six inches, and, in addition, quite a number of special steel sections were rolled, particularly to supplement the range of I-beam track. Styles in trolleys and conveyor chain ran the same course and multiplied, in spite of the fact that every new type installed in a plant necessitated its own special stock of repair parts and reserve equipment.

As plants became large, handling became more and more important; handling systems had to be extended and consolidated with other systems. Then management began to call for an accounting and to ask why the excessive inventory in spare parts and why so much reconstruction were necessary in the consolidation of more or less parallel systems.

However, keen competition in practically every line of manufacture has made imperative reductions that do not sacrifice quality, and under the intense economic pressure of the last few years the conveyor user has taken time to do his own thinking in regard to handling methods and handling equipment. In other words, it is very evident that the adoption of specified standards must be determined by the consumer or user rather than by the supplier.

The economic result of any standardization is far reaching in effect. The user pays less for his original installation because the equipment manufacturer is able to take advantage of volume production. The user is also able, by reason of the interchangeability of parts in his conveyor system, to reduce his stock of replacement units to a small fraction of that required when a number of equipment types were used. He pays less per unit for his replacement items and can depend on replenishing his supply on short notice. Thus his maintenance costs, as well as his original installation cost, are reduced and he requires less valuable factory space for storage.

Standardization means unified progress. Whether you are buying articles for yourself or quantities of material, you like to feel that you are getting good value for your money. The experience of both industrial and government purchasing agents shows that buying according to definite standards and specifications insures quality and, above all, saves money.

N.E.L.A. Publishes Book on Underground Systems

Manufacturers and users of underground equipment will be interested in a new book recently published by the National Electric Light Association entitled *Underground Systems Reference Book*. Copies may be obtained from the N.E.L.A., 420 Lexington Avenue, New York, N.Y., the price to National Electric Light Association members being $4.00, and to non-members $6.00.

What the Standardization of Paper Means to Producers and Purchasers[1]

by

R. H. Simmons
U. S. Government Printing Office

Standardization in the paper industry may be roughly classed under three heads: size, weight, and quality. Standardization of quality has met with the most opposition from paper manufacturers, and is the bone of contention when standardization is mentioned.

It is evident that standardization of sizes should take the interest of the consumer into account as well as those of the producer. Some odd sizes must still be produced, but the standardization of sizes has been of assistance in the standardization of office equipment, press sizes, and paper converting machinery. It has also reduced to a minimum the number of stock sizes carried by manufacturers. The manufacturer can increase the quantity of these standard items with a reasonable assurance that there will be a demand for them. It also helps the purchasing agents in that they are assured a ready supply. They can standardize their forms to match the standard sizes of paper and cut the cost of excess waste in conversion.

The standardization of weights of paper has also been fairly well taken care of by the manufacturer. Simplified Practice Recommendation No. 22 included the recommendation of a basis weight size of 25 × 40 inches, since calculation to 1000 square inches is easier to figure than calculation to 17 × 22, as for bonds, or 25 × 38, as for book papers. The adoption of the standard 1000 sheet unit in place of reams varying in count from 480 to 516 sheets is another step in the right direction. This simplifies calculations for the printer who sells in units of 1000.

The standardization of quality, however, has been woefully neglected as far as the papermaker is concerned. There have been several attempts to bring about standardization in quality, but the effort was not sufficiently sustained. The fact that the quality of paper can be standardized has been demonstrated by the United States Government, which for more than 20 years has bought its paper on quality specifications. There has been considerable opposition to these specifications at various times by individual contractors, but the fact that the opposition was not justified is becoming more and more evident as shown by those manufacturers who readily make paper to conform with specifications. Thirty-nine manufacturers and jobbers submitted bids this year on the annual contracts for 408 items of paper purchased for use in government printing and binding. All bids must be on specifications; if a bidder submits a sample, his bid is not considered.

The original specifications drawn up by the government for the purchase of paper were necessarily rather meager, due to lack of data as to what constituted satisfactory paper. At the time these specifications went into effect, there were few instruments for paper testing, and so there were few tests made. In 1925, the United Typothetae of America and the Government Printing Office cooperated in testing a large number of samples of commercial bond and ledger papers. The report on these tests included tentative specifications for bond and ledger papers which were later adopted for use in the purchase of these papers used by the government. Additional factors to aid in insuring permanency constitute the few changes which have since been made in these specifications.

Printing Paper Standards Needed

That there should be standards of quality in paper as well as in other products of manufacture has been recognized by many of the leading paper manufacturers. Standards are creeping into various parts of the paper industry, but the major class of papers—namely, printing and book papers—have not been touched by the trade. Fine papers such as bonds and ledgers are maintained by some individual manufacturers to their own standards.

Several mills have gone so far as to watermark their papers according to the grade which the paper is supposed, or guaranteed, to meet. They have standardized their products according to their own grades, which are not necessarily comparable to the grades of their competitors. Many paper companies have standardized in

[1] Reprinted from the June, 1931, issue of the *Purchasing Agent*.

this manner but are apparently not willing to adopt the national standards which would result from a definite program of standardization by the paper industry.

To be successful, standardization must show a benefit to the consumer as well as the producer. The standardization of paper will be constructive and not destructive. The reduction of the number of grades of paper should be an advantage to both producer and consumer. If a mill can cut its stock from 40 grades to 20 or less, a saving should result in that there will be only half as many changes of furnish. Every papermaker knows how much this would mean in his mill. Nothing cuts down the production so much as continual changing of furnish. Then, the number of grades which they will have to stock will be cut one-half, which in turn will cut the cost of inventory. These are a few points in favor of standardization for the papermaker.

From the purchaser's point of view, standardization should give better value for money expended and better quality, in that the papermaker should be able through the increased manufacture of a few grades to improve the quality of his product and at the same time cut costs.

Standardization should increase the speed of deliveries, due to manufacturers and merchants stocking the standard grades in larger quantities. It should simplify purchasing due to the fact that fewer grades, with more marked differences between them, would not confuse the purchaser. Standardization of quality would not permit of the "just as good" salesman offering an inferior product. Standard grades of paper would make it decidedly easier to get the same grade and quality for reprints or for such jobs where there is an annual publication, and it is desired to keep the same grade and color of paper.

Color, finish, and formation are mill characteristics and since the appearance and distinction of the finished job depends to a considerable extent on them, a good portion of the cost of the paper is often represented by these items. It is conceivable that of two papers of the same basic quality one might cost, and be well worth, considerably more than the other, due to its superiority in these respects.

Standardization of paper should result in a decided saving and ease in estimating costs for printing. It would eliminate guesswork and make it possible to buy or order printing on a more business-like basis. In other words, standardization will put a common language into the hands of the papermaker and the purchaser of paper by which they can carry on their business in more harmony than has been heretofore evidenced.

Need for Plumbing Codes Widely Discussed

Widespread discussion of plumbing codes is to be found in the publications of several trades and industries concerned with plumbing. There is frequent comment in these publications on the great differences in the codes of various municipalities. Such differences have been revealed in the study of venting practices in various cities made by R. M. Starbuck, Jr., and reported in a series of articles in recent issues of *Domestic Engineering*. Mr. Starbuck mentions the fact that the best plumbing regulations are usually to be found not in the largest cities but in medium-sized cities, and that small cities frequently have excellent plumbing regulations. The May, 1931, issue of the *Plumbers and Heating Contractors Trade Journal* said:

> "Many hold that the day will come when, in the interests of standardization, there will be a federal plumbing code under the provisions of which all State Codes will be uniform in all parts of the United States."

Although the development of a national plumbing code applicable to the United States is perhaps somewhat beyond our present horizon, the benefits of safe and sane regulations covering plumbing installations are becoming more generally recognized. The public health authorities—federal, state, and, in many cases, those of municipalities—are keenly alive to the dangers inherent in poor plumbing. Realization of the value of standard plumbing codes in municipalities has given an impetus to the efforts of health authorities to procure the enactments of state codes. Where uniform state codes have been promulgated their value to residents in small towns and in the rural sections has become well recognized. Farmers may now have sanitary protection comparable with that enjoyed by the city dwellers. In recent months the agitation for state-wide plumbing codes has been marked in Louisiana, Mississippi, Rhode Island, West Virginia, and Arizona.

In connection with the recent campaigns for regulations covering plumbing, the standardization of equipment and materials entering into plumbing installations has been discussed. A particularly pertinent comment on this phase of the problem appeared in an article in a recent issue of the *Southern Plumber*, New Orleans, Louisiana. This article by John Heinkel, president, Blake Specialty Company, says in part:

"I would state that, in my opinion,

standardization is a benefit, due to its simplicity for continuous duplication and the lower cost of manufactured material.

"Great variety which is not interchangeable is a source of increased cost and in many cases offers undue and inconvenient delays, particularly in replacements.

"It burdens the manufacturer with heavy investments of very doubtful values, causes him delays in the execution of orders, and in passing this on through jobber, plumber, and consumer all must share the grief and expense.

"In standardization, we find an even flow of production, an opportunity of assembling units of different manufacturers, an opportunity of securing repairs more readily, and, above all, capital can cover a longer range of merchandise that is ready, usable material.

"Of course, I am not unmindful of opinions of some of the plumbing trade, particularly those who do more jobbing work than new contract jobs, who think that the old complicated method of mixed threads, sizes, designs, etc., afforded them a better chance to provide business that found its way to the plumbing shop only, but we are in an age of progressiveness and cannot stand still.

"Is it not a fact that the more one standardizes his product the more people he will sell, due to lower selling price, which attracts those who formerly considered price out of range?

"Take the auto, the radio, the washing machine, etc., and you will understand what I mean.

"In former years it was considered a luxury to own one bathroom in a home, while today a modern home has from two to three bathrooms, or even more, and lower cost played its part in this demand.

"In a progressive movement, selfish ideas must be forgotten, and one must think in terms of benefit to the greater majority of the human family, and certainly standardization is helpful in that respect."

A.S.T.M Committee Preparing Statement on Wrought Iron

Committee A-2 on Wrought Iron of the American Society for Testing Materials is undertaking the preparation of a detailed statement and a discussion of what constitutes "quality" in wrought iron. The members of the committee, which is headed by H. W. Faus, Engineer of Tests, New York Central Lines, will supply information and data on this subject to the subcommittee in charge. There is little or no published information on this subject and it is believed the results of the effort will be of interest and value to industry in general.

Committee A-2 has had two specifications which are under its jurisdiction approved as American Tentative Standards by the American Standards Association. They are:

Standard Specifications for Refined Wrought-Iron Bars (A 41-30) (ASA No. G12-1931); and

Standard Specifications for Wrought-Iron Plates (A 42-30) (ASA No. G13-1931).

In addition, consideration is now being given to the submittal of four other A.S.T.M. Standards to the ASA for approval as American Standards.

A.S.T.M. Lime and Gypsum Committees Conduct Surveys

The standing committees of the American Society for Testing Materials on Lime and Gypsum have recently announced the addition of several different investigations to the programs of the subcommittees connected with these main projects. Several agencies will cooperate with the research connected with these investigations. Among the organizations which are expected to contribute are the U. S. Bureau of Standards and the Non-Metallics Station of the U. S. Bureau of Mines, together with certain other research organizations. It is expected that the results of some of the proposed investigations and also some of the A.S.T.M. specifications for lime and gypsum that have already been developed will be presented in due course to the ASA through the Sectional Committee on Specifications for Plastering, A42.

The Committee on Lime, it is expected, will give attention to further revisions for Standard Specifications for Hydrated Lime for Structural Purposes in the light of new developments; the U. S. Bureau of Standards is now drafting a new method for testing the soundness of limes. A new subcommittee under the Chairmanship of Professor J. R. Winthrow, Ohio State University, is to study some of the physical characteristics of lime, the use of accelerators combined with fine grinding, and the slaking rates of shaft of rotary kiln lime. Lime for the chemical industries will be in the hands of another subcommittee which will consider the preparation of specifications for lime for

use in manufacture of glass and also for the manufacture of calcium arsenate. A survey will also be made to determine the need for further lime specifications in the chemical industries.

The Committee on Gypsum (H. J. Schweim, Chief Engineer of the Gypsum Association of Chicago, *secretary*) has outlined an interesting program of work for the four subcommittees. A correlation of the work being done on the uses of gypsum and anhydrite is to be made, and the investigation of the uses of these minerals as retarders for Portland cement is to be continued. The Subcommittee on Gypsum Plasters is to study methods for determining consistencies and time of set of gypsum plasters and investigate the tensile strength requirements. Volumetric changes in neat gypsum and gypsum fiber concrete in varying temperature and humidity conditions are to be studied by Subcommittee III. Studies of methods for testing of gypsum products and their relation to specifications in standard practice are on the program for a subcommittee dealing with methods of testing.

German Railways Issue Paint Specifications

The first official specifications for cellulose lacquers issued by the German State Railways in 1927 have just been revised. According to an article in the *Chemical Trade Journal*, London, the revised specifications provide that

> "nitrocellulose lacquers (pigmented and non-pigmented) must be delivered in a condition ready for application by the spraying process. This condition is considered to be met by a lacquer having a viscosity not exceeding 25 deg Engler at 20 deg C. The lacquer should contain at least 20 per cent of binder calculated on the clear lacquer, that is to say, free from pigment. The binder should contain at least 25 per cent of nitrocellulose, the balance being made up of non-volatile products (plasticisers, fatty oils, or copals). It should not contain coumarone resins nor substances giving a positive Storch-Morawski reaction (rosin and its compounds). For the purpose of the specification, non-volatile products are considered those which do not lose more than five per cent of their weight when the binder is heated for 100 hours at 80 C. The solvents and diluents should not contain highly toxic materials such as benzol or the chlorinated hydrocarbons, and the ignition point should be as far as possible above 21 C.
>
> "The cellulose lacquers when applied to wood should not give, after drying, a coating which presents fire danger. For the purpose of the specification a coating is considered non-dangerous when, applied to a plank of alder wood and dried for two days, the ignition produced when touching one spot of the plank held in a vertical position with a gas flame one centimetre long, does not spread."

Another specification of the German Railways deals with the painting of ironwork. The specifications are divided into four sections: paints; anti-rust and similar preparations; painting instructions; miscellaneous directions. Special rules have been drawn up, according to an article in the June 19, 1931, issue of *Oil and Color Trade Journal*, London, prohibiting the unauthorized use or purchase of paints by railway employees, providing for the carrying out of certain tests by a duly qualified chemist in the railway laboratories, and for general rules as to delivery and contract conditions.

The regulations concerning the painting of two iron surfaces in contact with each other are designed to reduce risk of lead poisoning among the workmen, it is said. The railway companies have carried out a considerable amount of research on this subject.

Simplification Program for Die Head Chasers Reaffirmed

Simplified Practice Recommendation 51-29 covering die head chasers, which the Division of Simplified Practice of the U. S. Bureau of Standards estimates has been instrumental in effecting a reduction of approximately 75 per cent in the number of stock varieties, has been reaffirmed for another year, without change, by the standing committee of the industry, the Division has just announced. The recommendation applies to self-opening and adjustable die heads.

Circular on Sheet Metal Issued by Bureau of Standards

Those interested in the standardization of sheet metal will find a valuable survey of present practice in a circular (number 391) issued by the Bureau of Standards on *Standard Thicknesses, Weights, and Tolerances of Sheet Metal (Customary Practice)*. The pamphlet covers American and foreign practice for both ferrous and non-ferrous sheet metal.

The Classification of Coal as a Means of Simplifying Purchasing[1]

by

R. E. Gillmore[2]

Active, organized coal classification committee work with the object of arriving at a uniform classification of North American coals began nearly five years ago at the time of the first International Conference on Bituminous Coal held in Pittsburgh in 1926. Schemes for classifying coal had previously been presented by Campbell, Parr, Fraser, Grout, Ashley, Ralston, Thom, and others in the United States, and Dowling, Stansfield, and others in Canada. Most of the classifications devised by the men just mentioned are based mainly on chemical properties, and deal with coals in their natural order, ranging from peat and the lignites on the lower end of the scale to anthracite on the upper end. Some of the classifications, however, such as those of Campbell and Bone, do correlate certain physical characteristics with the chemical properties. Such classifications are in addition to, and not necessarily correlated with, numerous commercial classifications for one or more types of coal, of which perhaps the best known are the Tidewater Coal Exchange Pool classifications, used during the War and since.

The active committee work that took form in 1926 was sponsored by the American Society for Testing Materials, according to the rules of the American Standards Association, and it is known as the Sectional Committee on Coal Classification (M20). The scope of this committee, as described in both the ASA and A.S.T.M. Year Books, is:

> "The classification of all coals from anthracite to lignite, to be based upon such chemical and physical characteristics as will make the plan most readily adaptable to industrial and commercial use on a national scale."

The fact that the (A.S.T.M.) sectional committee is organized according to the rules of the American Standards Association, which provides that the membership shall be authoritatively and adequately representative of the various interests concerned, is significant. The present membership of the committee, totaling 29, comprises eight producer representatives, two distributors, nine consumers, and ten members representing general and scientific interests. Each member is chosen or appointed by an organization such as the National Coal Association, so that it may be said that there are at least as many large organizations represented as there are members to the main committee. For the purpose of having smaller working units, the sectional committee is divided into three technical committees of ten to twelve members each, dealing with (1) scientific classification, (2) use classification, and (3) marketing practice.

There is considerable overlapping of membership which insures coordination between the three sectional committees, and subcommittees of the same.

Problem Complicated

The coal classification problem is by no means as simple as it might seem. The final classification, if and when consummated, will likely be sufficiently concise to go on one or two printed pages, but the process of arriving at a simplified, uniform classification of North American coals that will be of value to both the producers and consumers of coal, as well as the fuel technologists and research men, is complicated. The problem at present is to digest the large amount of technical information available, and to interpret it in terms understandable and acceptable to all concerned.

The ultimate aim of the coal classification committee work now under way is to make available to the purchaser and consumer of coal full descriptions as to chemical and physical characteristics of the different classes of coal under a definite nomenclature. Hence, if and when coal producers and distributors are able to sell their product on a definite classification and trading for a given use, similar, for example, to the S.A.E. number system now used for lubricating oils, the selling and purchase of coal would become much more simplified. Some of the larger producers and distributors of coal are now equipped with sufficient technical control over their product that they can guaran-

[1] Reprinted from the June, 1931, issue of the *Purchasing Agent.*

[2] Superintendent, Fuel Research Laboratories, Mines Branch, Department of Mines, Ottawa, Canada.

tee the quality delivered, but the time when purchasing agents can make their coal purchases by the simplified procedure just outlined is a long way off. In the meantime, however, the purchasers of coal, by following a few simple rules, can guarantee that they are getting good value for money expended.

Saving through Specifications

As a rule the best quality coals are worth and can maintain a premium price, and the price quoted by reliable dealers is a direct indication of the quality that can be delivered, but, with a fuller knowledge of the characteristics of a coal required for a use in view, considerable savings can without doubt be made by purchasing coal according to specifications. Chemical analyses for ash content, calorific value, etc., are important, but should be considered a secondary rather than a primary specification. The first information to obtain is what is the proper sizing for the purpose in view, and second, what are the storage and handling properties of the coals offered. At this point it may be remarked how the extensive, and mostly recent, changes in coal-burning equipment have greatly influenced the specifications as to sizing. I refer to special furnaces and appliances for burning buckwheat and other small sizes of anthracites and other "household" fuels, to mechanical stokers for burning slack coal for industrial steam-raising purposes, and to the great increase in the use of coals in the pulverized form. In the last instance, it is also significant to observe how little is known of the comparative grindability or ease of pulverization of the different coals marketed, but generally speaking, it would appear that the coals that can be pulverized with the least expense are the more friable, low-ash coals that, on account of their correspondingly high calorific values, are premium fuels in respect to quality for this particular use.

A coal that looks good, has a satisfactory chemical analysis, and can be purchased at a reduced price, may, on account of inferior storage qualities, heat or take fire in the bin and thus prove a very expensive coal indeed. Specifications should, therefore, contain protective clauses as to freedom from extraneous matter, size, storage, and the general burning qualities in respect to bothersome clinkers, and after these are inserted, more or less loose or indefinite chemical analysis specifications may be inserted. Instead of purchasing coal on a definite penalty or bonus basis, the writer favors a system where the purchaser retains the privilege of either canceling the contract or of penalizing the seller if and when the quality of the coal delivered falls consistently below that guaranteed and contracted for.

Excess moisture is the first thing to watch, but even with this variable a spirit of give and take should exist to allow for changes in moisture content when the coal is shipped in open cars during the wet seasons. The ash content is next and is just as important as the moisture content since the calorific or heating value of the coal as delivered and paid for is directly influenced by these two criteria. The volatile matter, fixed carbon, coking properties, etc., will determine roughly the kind of coal delivered in comparison with that contracted for, and once this is done, the occasional checking of the moisture and ash contents serves as a means of knowing whether or not the quality or grade guaranteed is being lived up to. In this way, the expense of either maintaining an elaborate chemical laboratory or of having a large number of samples analyzed may be greatly reduced and ultimate saving effected, as compared with the system, or rather lack of system, where no specifications are employed.

A typical specification according to the above suggestions would, in addition to a description as to kind and sizing, include: stipulations as to freedom from excess moisture and extraneous matter; and safeguards against poor storage and burning qualities include a clause concerning the ash content and calorific values somewhat as follows:

> "The coal delivered shall have (on the dry basis) an ash content not exceeding ten per cent, and a calorific value of not less than 13,500 Btu per pound."

Such a clause would apply generally to bituminous coals for steam-raising purposes, and is one which slack coal from Nova Scotia, for example, could readily comply with. Consistent deliveries of this quality would, in the opinion of the writer, represent good average "steam" coal, and deliveries better in quality may be considered as premium coals. For coals from certain districts in Canada, however, such as the Alberta Crowsnest Pass area, the maximum ash and minimum calorific value may be 14 per cent and 13,000 Btu per pound, respectively, for which coals the remarkably high ash fusibility temperature is a compensating factor.

German Rules for Electrical Plants aboard Ships

Rules for the Installation and Operation of Electrical Plants aboard Ships, DIN HNA BVE 1, a handbook published by the German national standardizing body, has just been received at the ASA office and is available for review by those interested.

Adoption of Standards Urged as Next Step in Preparation of Bituminous Coal

Of particular interest in connection with recent proposals to develop standard specifications for prepared bituminous coal is a paper by T. W. Guy, Consulting Engineer, Charleston, West Virginia, entitled *Growth of Coal Preparation in the Smokeless Fields of West Virginia* (TP No. 437, American Institute of Mining and Metallurgical Engineers). This paper is on the program for discussion at the Bluefield, West Virginia, meeting of the A.I.M.E., October 9.

In the paper, data on the growth of coal preparation and the relation of the production of washed coal in comparison with the total output of the smokeless fields[1] are presented. The writer shows that, since the first washer was installed in 1903 in the Pocahontas field, the movement for cleaning coal has increased until now 73 plants of 54 different companies have mechanical cleaning operations of several different types. These 73 plants produced about 42½ per cent of the total output of the smokeless fields in 1930. Furthermore, even in 1930 with its markedly decreased production of bituminous coal, the companies producing washed coal were affected less by the depression than were other plants of the smokeless field. Moreover, groups of mines that cleaned all of their coal showed less decreased production in 1930 than groups that cleaned only part of their output. Also, both groups that practiced mechanical cleaning showed some advantage in output over plants without mechanical cleaning.

It may be of interest to present the author's comments concerning the need for standardization in bituminous coal preparation. He writes as follows:

"The writer believes that the next steps in bituminous coal preparation will be:

"1. A drive for uniform quality in the products shipped. Practically all complaints from consumers specify a lack of uniformity in ash, sizing, fusing, or other characteristics. They insist that uniformity is necessary for uniform results, and that uniform results are necessary for economy. Since the consumer will not remain sold on any product that varies materially in quality, the producer should concentrate on uniformity and pay less attention to average characteristics. This seems to offer the greatest inducement to the consumer to pay the necessary cost of preparation.

"2. The close coordination of preparation and marketing plans. In the mining, preparation, and marketing of the output of a mine, the objective, of course, is to produce the largest net profit. Throughout the three operations, each step should be planned to this end. When this is lost sight of, it frequently happens that ash reduction is carried beyond the market requirements in some cases, and not far enough to meet the requirements in others, the result being a heavy loss in both cases. Making a concession on size, or agreeing to meet lower ash specifications, etc., may increase preparation or mining cost out of all proportion to the value of the business involved. Such difficulties may be avoided by carefully determining beforehand what products can be made economically, and what costs would be necessary to meet certain changes in specifications.

"3. Cooperation of producers and consumers in establishing standards for the preparation and marketing of coals. The question of establishing standards for coal preparation in the bituminous fields has been discussed frequently. Recently, Mr. Eavenson, Chairman of the Coal Division of the A.I.M.E., has requested the American Standards Association to cooperate with the Institute in formulating such standards.

"The idea seems to prevail that the question is too complicated and difficult for solution, because of the wide variation in quality and characteristics, and the wide variation in uses, of bituminous coals. This might be true, but it should be remembered that the products of practically all industries have been more or less standardized, and that such standardization has always been an important factor in stabilizing the markets, in reducing costs, and building up good will.

"The tremendous sale of goods in standard packages, at prices higher than the cost of similar goods that are without the

[1] The term "smokeless fields" is applied to certain coal measures located in Fayette, Raleigh, Wyoming, McDowell, Summers, and Mercer counties in the extreme southern portion of West Virginia and to the adjacent counties of Buchanan and Tazewell in Virginia.

uniform quality guarantee which the package and trade-mark gives, demonstrates the tremendous popular appeal of standardized products. Back of this demand are sound economic principles, the first and most important of which is that uniform products give uniform results in use; another is the confidence and satisfaction that comes from feeling that you know what you are getting for your money.

"A prominent mine official in the Pocahontas field has expressed his belief that if definite standards could be adopted in the Pocahontas field, by which a producer could know definitely that he had shipped the product which he sold and by which the consumer could know that he had received what he had bought, such standards would be worth several hundred thousand dollars each year to the operators of the field.

"In the absence of standards, there is a tendency for each concession made by an individual operator in size or quality of the product to be forced upon his neighbors and competitors, with the natural result that everyone finds himself continually forced to give more and more for the same returns. At the same time the consumer, owing to indefinite specifications, is still dissatisfied with what he receives.

"The consumer, after spending much time and money testing coals in order to find the best fuel value, based on results and costs in his plant, still feels the need of definite standards by which both inherent and preparation values can be readily specified and measured, in order to be sure of getting the results shown by his tests.

"In the lumber industry, where the many kinds, sizes, grades, and uses would seem to offer insurmountable difficulties, standards have been adopted which work to the satisfaction and benefit of all concerned.

"Unquestionably, there are many complications and difficulties to be solved before such standards can be made fully effective in the bituminous coal industry, but if a start is made, there is no doubt that standards can be worked out which will gradually come into general use; and which will be of great benefit to the individual producer and consumer, and to the industry as a whole."

Standard for Rayon Underwear Issued by Bureau of Standards

The Bureau of Standards, United States Department of Commerce, Washington, D. C., has, under date of August 5, 1931, circulated to the industry copies of the Recommended Commercial Standard for Knit Rayon Underwear covering standard measurements, methods of measuring, and tolerances for men's and women's circular flat knit and men's ribbed rayon underwear, as adopted by the general conference of producers, distributors, and users of this commodity on June 24, 1931. The methods and measurements given in this recommended commercial standard apply to finished garments as delivered by the manufacturer. Copies of this standard in mimeographed form may be obtained from the ASA office or direct from the Bureau of Standards.

A.S.T.M. Technical Papers May Be Borrowed

The following papers presented at the Thirty-Fourth Annual Meeting of the American Society for Testing Materials held in Chicago, June 22 to 26, have been received by ASA and are available for loan to Sustaining-Members:

Accelerated Freezing and Thawing as a Quality Test for Concrete Aggregates, F. C. Lang and C. A. Hughes

Comparative Tests for Determining Resistance of Fire-Clay Brick to Thermal Spalling, R. A. Heindl

The Concrete Flow Trough, Donald M. Burmister

Crystalline Talc as an Admixture in Concrete, Frank R. Wicks

Damping Capacity of Materials, G. S. von Heydekampf

Fatigue Testing of Wire, Stephen M. Shelton

Fatigue Tests in Shear of Three Non-Ferrous Metals, H. F. Moore and R. E. Lewis

Fatigue Tests of Weld Metal, R. E. Peterson and C. H. Jennings

The Hiding Power of White Pigments, G. S. Haslam and D. L. Gamble

The Measurement of Large Brinell Impressions in Steel Rails, H. H. Morgan and J. R. Mooney

Methods for Determining the Physical Properties of Certain Rubber Compounds at Low Stresses, R. L. Templin, and R. G. Sturm

Modern Paving Emulsions, Types, Characteristics and Test Methods, C. L. McKesson

Oxygen as a Factor in Submerged Corro-

sion, Edward C. Groesbeck and Leo. J. Waldron

The Photo-Electric Cryptometer, A. H. Pfund

Relation between Magnetic Properties, Impact Strength and Hardness, Haakon Styri

Some Physical Properties of Hardened Tool Steel, J. V. Emmons

Specifications for Hollow Masonry Building Units, Douglas E. Parsons

The Static and Fatigue Properties of Brass, J. B. Kommers

Symposium on Abrasion Testing of Rubber

Symposium on Malleable Iron Castings

Symposium on Weathering Characteristics of Masonry Materials

Temperatures Developed in Mass Concrete and Their Effect upon the Compressive Strength, R. E. Davis and G. E. Troxell

Tests of Concrete Conveyed from a Central Mixing Plant, Willis A. Slater

Tests of the Fire Resistance and Stability of Walls of Concrete Masonry Units, C. A. Menzel

Tests of the Stability of Concrete Masonry Walls, F. E. Richart, P. M. Woodworth, and R. B. B. Moorman

Thermomagnetic Analysis and the A_0 Transformation in 0.75-Per Cent Carbon Steel, R. L. Sanford and G. A. Ellinger

The Unbalanced Alternating Current Bridge for Magnetic Analysis II, W. B. Kouwenhoven and J. H. Lampe

Committee Revises Recommendation on Carbon Brushes and Shunts

A recent meeting of the standing committee in charge of Simplified Practice Recommendation R56–28, Carbon Brushes and Brush Shunts, published by the National Bureau of Standards, voted to reaffirm all items in the present recommendation with the exception of brush dimensions. In the opinion of the members, a further simplification of dimensions could be agreed upon by all parties concerned within the next few months. The committee therefore voted to hold in abeyance the publication of a revised recommendation until the new list, showing a smaller number of brush dimensions, had been approved by manufacturers of brushes, and of motors and generators.

The committee further voted to include in the revised recommendation certain additional definitions, together with a table showing the nomenclature recently adopted by the brush manufacturers to indicate the various standard types of shunt connections. It was hoped that a further reduction could be made in the number of shunt lengths. Some of the manufacturers have already reduced the number of lengths from six to three.

Standardization of Knock Rating of Motor Fuels

The standardization of methods of determining and designating the knock rating of motor fuels has been making gratifying progress. This problem, so important to manufacturers who in recent years have been producing motors with higher compression in answer to the demands of the American driving public for high-powered cars with quick acceleration and ease of starting, has been studied for about three years by a committee formed by the Society of Automotive Engineers, the American Petroleum Institute, the National Automobile Chamber of Commerce, and the U. S. Bureau of Standards. This investigation has now been nearly completed.

The test itself is a measure of the knocking value of the motor fuel by comparison with standard mixtures of iso-octane and normal heptane. The standard mixtures contain amounts of the two components that vary uniformly and are marked in terms of the octane number, which is the percentage of iso-octane contained in the mixture; e.g., a mixture of 20 per cent iso-octane and 80 per cent normal heptane would be marked as "Octane Number 20," and similarly a mixture with 70 per cent iso-octane and 30 per cent normal heptane would be marked as "Octane Number 70." The test is performed in a standardized internal combustion motor operated in accordance with specified laboratory conditions. The knock rating of the motor fuel under investigation is thus actually determined and is designated by the octane number of the standard mixture that gives the same knock under comparable test conditions. It may be of interest to note that the standard for ethyl gasoline is Octane Number 74.

Some progress toward international cooperation in the direction of standardized methods for the knock rating of motor fuels has also been effected. A conference between American and British experts has resulted in certain recommendations which indicate that the results of American research may be acceptable to European technologists. Proposals have been made by certain British engineers that unification of laboratory procedure and nomenclature be based upon American practice.

B.E.S.A. Publishes Standard Schedule of Colors

The British Engineering Standards Association has made a useful advance toward the standardization of color by the production of a Standard Schedule of Colors for ready-mixed paints. The schedule includes 64 colors, the names of which have been determined by a study of various color cards, the colors chosen to fit each name representing a consensus of opinion.

Concerning the value of the schedule and the work of the B.E.S.A. committee which produced it, the *Financial Times* of London comments as follows:

> "When the committee settled down to its task it was confronted with an enormous number of color cards published by manufacturers and suppliers of ready-mixed paints. There were nearly 3000 different colors and many hundreds of different shades of some of the colors and many names for the same colors. One can readily imagine how all this confused the customer without assisting trade, to say nothing of the waste in manufacture and the congestion of store room represented by the production of so many totally unnecessary descriptions.
>
> "The committee took three things as its objective—the selection of a reasonable number of popular colors for standardization, the fixing of an agreed name for each color, and the inclusion of a colorimetric analysis to secure the maintenance of the color standard regardless of any fading of the color patterns. The perfected schedule embraces 57 colors, the name in each case being self-explanatory to the ordinary user and devoid of technical terms. This is a drastic improvement on the chaos of 3000, many of which are simply duplicates or ridiculous variations. The advantage of the simplified schedule, not only to builders, decorators, and painters, but to the commonplace householder will be invaluable."

Another comment which shows the wide interest aroused by the schedule is from the *Journal of the Department of Agriculture*, London:

> "It will be objected that the fixing of a certain name to a certain color is purely arbitrary, and admittedly that is the case, but it does not lessen the value of the schedule, which sets up, for the paint and painting trades, a standard by which it may be known just what is meant by a certain color name."

Copies of the standard schedule, B.E.S.A. No. 381-1930, are available for loan to interested parties by the American Standards Association.

New Device Measures Abrasion of Textiles

The question of testing the abrasion resistance of textiles has always been a very difficult one. Abrasion resistance is fundamental to the life of textiles in so many different ways, however, that it is felt that companies concerned with the standardization of wearing qualities of fabrics will find the following note from the March issue of the *Melliand Textile Monthly* of some interest:

> "An abrasion tester which has proved to give excellent results in determining the comparative wearing qualities of fabrics has been placed on the market by the well-known firm of Schopper in Germany. . . . The apparatus is for both heavy and light fabrics.
>
> "An outstanding feature of this tester is that it subjects the test sample to a combined rotary and rolling motion, instead of to a straight one-way friction. Its action faithfully duplicates the varied contacts, from all angles and directions, to which many fabrics are subjected in actual wear. The number of revolutions under abrasion to which the specimen is subjected is set standard at 5000 or 10,000. The standard testing speed is 70 to 80 rpm. Before the test, the sample is weighed within a tolerance of $^1/_{100}$ gram. Upon the conclusion of the test, the specimen is taken out of the apparatus, brushed off well, and weighed again. The loss in weight caused by abrasion is then computed in grams.
>
> "In the operation of the test, the specimen, cut to standard size by means of a disc-shaped template, is fastened upon a metal base and the loading device is lowered so that the abrasive is brought to rest on the specimen. The load may be varied as desired. The abrasion when the tester is put in operation is in different directions and, with interruptions, on different spots so that the fibers may rise from time to time. The abrasion is measured by determining, after a certain number of revolutions, the loss of weight, as stated above, or the increase of air permeability, or by visual inspection. The number of revolutions are indicated on a dial. The tester is equipped with a specially-built electric motor, with variable speed control, and can be operated from any convenient light socket." F.J.S.

ASA PROJECTS

Introduction of Standards into Practice Studied by ASA Special Committee

Regional and local meetings and closer contacts with organizations suggested to secure wider use of American Standards

At its meeting of March 12, 1931, the ASA Standards Council considered the desirability of keeping in regular contact, through meetings, with men in charge of standardization work within companies. This idea was expanded to include not merely "experience meetings" for the discussion of company problems, but also of other subjects connected with the standardization movement. Accordingly, the chairman of the Standards Council was authorized to appoint a committee to study the problem and report back to the Council.

A committee, consisting of the following members, was appointed and held a meeting on July 15, 1931: Dr. Zay Jeffries, *chairman*, Fred Colvin, F. O. Hoagland, C. B. LePage, David Levinger, C. W. Machon, D. F. Miner, C. B. Veal, W. C. Wagner, and C. L. Warwick. John Gaillard, Mechanical Engineer of the ASA staff, was appointed secretary. The committee expressed the unanimous opinion that more effort should be expended to secure the introduction of American Standards into practice, part of the reasons given being that this will focus the attention of industry on the economic advantages of standards; that efforts in this direction will make known to industries the existence of ASA standards which should result in the wider adoption of such standards; and that, in cases where ASA standards are known to the industry but not used, the reason for the lack of adoption will be ascertained. Also, the need for and establishing of other standards will be brought out; information will be obtained as to how standardization work is organized in individual companies; and contact with industries will spread information concerning the principles, organization, and activities of ASA as the national standardizing body.

It was also unanimously voted that the promotion of American Standards into practice should be accomplished by providing additional support to the ASA staff. No need was seen for a standing committee on the subject.

Among the reasons advanced for giving preference to the ASA staff for handling this kind of work, the neutral character of the ASA staff was mentioned, and also the fact that the staff should use the entire Standards Council collectively and individually for advice in this matter, rather than to depend on a special committee which cannot possibly be as representative as the Council as a whole.

A memorandum prepared by the ASA staff on ways and means of carrying out the work in question was submitted to the special committee upon its request, and a report to the Standards Council was made at its meeting held on September 10, 1931, by the chairman of the special committee, Dr. Zay Jeffries.

In addition to the principles already mentioned above, the following ways in which the promotion of company standards and the introduction of standards into practice might be facilitated were submitted for consideration of the Standards Council:

1. Publication of articles in magazines and newspapers, publicity releases, and the publication by ASA of printed matter (pamphlets, etc.) prepared by the ASA staff or others.

2. Talks given and papers read at meetings organized by organizations other than ASA, particularly trade associations, technical and professional societies and associations, chambers of commerce, educational institutions (colleges, universities), etc. This plan also applies to more extensive speaking tours covering a series of meetings whose dates are to be carefully laid out in advance.

3. Promotion meetings especially organized by ASA in different industrial centers. These meetings should preferably be organized with the assistance of the local ASA representative—if there be one—or a local committee organized for the purpose. Local or regional organizations (chambers of commerce, local sections of technical societies, etc.) could lend valuable support in this respect.

It seems that the program for such a meeting should essentially include:

a. Papers read by individuals asso-

ciated with major local industries, dealing with the advantages of standardization and the organization of standardization work, especially in companies.

b. At least one paper read by a member of the ASA staff, to explain the ASA work.

c. A general discussion of practical problems in the standardization field, among other things to bring out the need of new standards and possibly the necessity of revising existing ones.

4. Sending out letters to sectional committees inviting them to promote the use of the standards which they have helped to develop.

5. Sales campaigns of approved standards to selected groups.

6. Visits to organizations with the purpose of finding out how far the work of ASA is known; with what result standardization in general is applied; and more particularly, to what extent American Standards are used. Assistance to be offered, to the extent the organization concerned may wish to avail itself of it, and within the limits to be set by ASA.

In this connection the widest possible use should be made of introductions to companies, etc., supplied by local representatives.

7. Organizations—such as trade associations, technical societies, companies, etc.—might be invited to have one of their staff men or some other representative in the ASA office for a certain period of time in order to become acquainted with the theory and practice of industrial standardization.

The methods mentioned above under the numbered items with the exception of 2—organizing ASA meetings in industrial centers—have already been applied to a certain extent by the ASA staff during a longer or shorter period of time.

In making approaches along any of the above-mentioned lines, it is of great importance that they be made through the management of the organization concerned. In fact, staff men, like chief engineers or standardization engineers, often have great difficulty in promoting the cause of standardization in their own plants. It is, therefore, suggested that members of the Board of Directors, the Standards Council, and anybody else who wishes to assist ASA in promoting this work, supply the ASA staff with information regarding any possibility of bringing the cause directly before the president or some other higher executive of an organization who may be able to lend the ASA cause active support.

The special committee also offered, merely as a suggestion, that an effort might be made to promote the use of American Standards in industrial organizations by selecting, say, one to ten companies and having each of these contacted by a member of the engineering staff of ASA. This engineer should explain the purpose and nature of the ASA work and the value of national standards developed under ASA procedure. He should assist in finding out, in cooperation with the company management, in what manner American Standards could be advantageously used by the company. He should ascertain in what respects needed standards are lacking or deficient. To do so effectively, he probably should supervise the development of this system, at least until such time as the benefits derived from the use of American Standards became apparent. After a certain period of time, say, six months or one year, a report could be made and an appraisal as to the value of this activity would be possible.

The Standards Council voted that the report be received and submitted to the Board of Directors of ASA.

Committee on Classification of Coals Changes Personnel

A. C. Fieldner, chairman of the Sectional Committee on Classification of Coals (M20), has announced the following changes in personnel of that committee:

S. B. Flagg, Fuel Engineer, Electric Bond and Share Company, representing the National Electric Light Association on the sectional committee, has been elected as vice-chairman of the committee, vice, W. R. Addicks, deceased.

W. Cullen Morris, Vice-President and Chief Engineer, Consolidated Gas Company, New York City, representing the American Gas Association, vice, W. R. Addicks, deceased.

T. A. Hendricks, Geologist, U. S. Geological Survey, Washington, D. C., (alternate) representing the U. S. Geological Survey, vice, Carroll E. Dobbin, resigned.

G. H. Cady, Senior Geologist of the Illinois Geological Survey, alternate to Dr. M. M. Leighton, representing the Association of State Geologists.

Notice appeared in the September issue of the BULLETIN that Dr. H. H. Lowry had been appointed by the American Chemical Society as its representative succeeding Dr. S. W. Parr, formerly Professor of Chemistry at the University of Illinois, recently deceased.

ASA Approves Safety Codes for Prevention of Dust Explosions

The American Standards Association has just approved a group of six safety codes, five of them for the prevention of dust explosions in industry. One of the codes provides for the use of inert gas for fire and explosion prevention.

There are over 28,000 industrial plants in the United States subject to the hazard of dust explosions. These plants employ approximately 1,300,000 persons and their annual production is valued at more than ten billion dollars.

The codes, which were prepared by the sectional committee under the sponsorship of of the National Fire Protection Association and the U. S. Department of Agriculture, are as follows:

Safety Code for the Installation of Pulverizing Systems for Sugar and Cocoa (Z12b-1931)

Safety Code for the Prevention of Dust Explosions in Starch Factories (Z12c-1931)

Safety Code for the Prevention of Dust Explosions in Terminal Grain Elevators (Z12e-1931)

Safety Code for the Prevention of Dust Explosions in Wood Flour Manufacturing Establishments (Z12g-1931)

Safety Code for the Prevention of Dust Ignition in Spice Grinding Plants (Z12h-1931)

Safety Code for the Use of Inert Gas for Fire and Explosion Prevention (Z12i-1931)

The Safety Code for the Use of Inert Gas for Fire and Explosion Prevention provides for the dilution of the air in enclosures in which flammable liquids, dusts, or vapors are handled, so as to reduce the oxygen content of the air to a point where combustion cannot occur. The code includes a table of the maximum permissible oxygen percentage for various flammable substances, and provides for the use of flue gases, carbon dioxide, and nitrogen, or other inert gases.

The regulations for the prevention of dust ignition in spice grinding plants has been prepared as a guide to safe practice in the construction and operation of such plants. Although there has as yet been no serious dust explosion during the normal operation of spice grinding plants, the existence of a potential hazard made the preparation of the code advisable.

The safety codes for the use of inert gas for fire and explosion prevention, for the prevention of dust explosions in wood flour manufacturing establishments, and for the prevention of dust explosions in spice grinding plants are new codes. The safety code for the prevention of dust explosions in terminal grain elevators is a complete revision of the code originally approved in 1928; while the safety code for the prevention of dust explosions in starch factories, and the safety code for the installation of pulverizing systems for sugar and cocoa represent minor revisions.

D. J. Price, U. S. Department of Agriculture, Washington, D. C., is chairman of the sectional committee, and Hylton R. Brown, U. S. Bureau of Chemistry and Soils, is secretary.

The organizations which were represented on the committee are as follows:

American Spice Trade Association

Associated Corn Products Manufacturers

Associated Factory Mutual Fire Insurance Companies

Association of Governmental Officials in Industry of the United States and Canada

Conference of Special Risk Underwriters

Dust Collection Equipment Manufacturing Group

Grain Elevator Constructors

International Association of Fire Chiefs

International Association of Fire Fighters

International Association of Industrial Accident Boards and Commissions

Mutual Fire Prevention Bureau

National Board of Fire Underwriters

National Bureau of Casualty and Surety Underwriters

National Electric Light Association

National Electrical Manufacturers Association

National Fire Protection Association

Pulverized Fuel Equipment

Railway Fire Protection Association

Society of Grain Elevator Superintendents of North America

Sugar Industry

Terminal Elevator Grain Merchants Association

Underwriters' Laboratories

U. S. Department of Agriculture
U. S. Department of Commerce, Bureau of Mines
U. S. Department of Labor
Western Actuarial Bureau

ASA Approves Standard for Drainage of Coal Mines

A revision of the American Tentative Standard for Drainage of Coal Mines (M6-1927) has been approved by ASA as American Recommended Practice. The development of this revision has been in the hands of a sectional committee under the sponsorship of the American Mining Congress for about three years. In that time six drafts of the material to be incorporated in the standard have been considered.

The new standard—American Recommended Practice for Drainage of Coal Mines (M6-1931)—presents in detail the methods of installation and operation of equipment used for control of mine drainage. Among the topics covered are the following: pumps, piping, storage of mine waters, limitations of natural drainage methods of unwatering abandoned workings, the effect of mine waters on drainage equipment, and recommendations regarding the use of acid-resisting metals and alloys.

W. E. Housman, Research Engineer, H. C. Frick Coal Company, Scottdale, Pennsylvania, is chairman of the sectional committee, and J. M. Hadley, American Mining Congress, Washington, D. C., is secretary.

Copies of this standard will be available shortly and may be ordered from the American Standards Association.

Representatives Appointed on New Electrical Committee

All of the constituent organizations of the Electrical Standards Committee[1] have now appointed their representatives. These representatives are as follows:

American Electric Railway Association—C. R. Harte, Construction Engineer, Connecticut Company, New Haven, Connecticut; *Alternate*—L. D. Bale, Superintendent of Power, The Cleveland Railway Company, Cleveland, Ohio.

American Institute of Electrical Engineers—H. P. Charlesworth, Vice-President, Bell Telephone Laboratories, New York, N. Y.; F. D. Newbury, General Manager Machinery Engineering, Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pennsylvania; L. T. Robinson, Engineer in Charge, General Electric Company, Schenectady, N. Y.

American Railway Association—Sidney Withington, Electrical Engineer, New York, New Haven and Hartford Railroad, New Haven, Connecticut.

American Society for Testing Materials—F. M. Farmer, Vice-President and Chief Engineer, Electrical Testing Laboratories, New York, N. Y.; *Alternate*—C. L. Warwick, Secretary, American Society for Testing Materials, Philadelphia, Pennsylvania.

Communication Group—H. L. Huber, Engineer on Foreign Wire Relations, American Telephone and Telegraph Company, New York, N. Y.; *Alternate*—W. M. Craft, Department of Operation and Engineering, American Telephone and Telegraph Company, New York, N. Y.

Electric Light and Power Group—L. L. Elden, Technical Adviser to the General Superintendent, Edison Electric Illuminating Company, Boston, Mass.; H. B. Gear, Assistant to Vice-President, Commonwealth Edison Company, Chicago, Ill.; R. H. Tapscott, Electrical Engineer, New York Edison Company, New York, N. Y.; *Alternate*—A. Maxwell, Engineer, National Electric Light Association, New York, N. Y.

Fire Protection Group—A. R. Small, Vice-President, Underwriters' Laboratories, New York, N. Y.; *Alternate*—R. B. Shepard, Electrical Engineer, Underwriters' Laboratories, New York, N. Y.

National Electrical Manufacturers Association—L. F. Adams, Commercial Engineer, General Electric Company, Schenectady, N. Y.; C. L. Collens, President, Reliance Electric and Engineering Company, Cleveland, Ohio; S. L. Nicholson, Acting Vice-President, Westinghouse Electric and Manufacturing Company, New York, N. Y.

U. S. Army—Col. James B. Allison, Signal Corps, U. S. Army, Governors' Island, N. Y.; *Alternate*—Capt. James A. Code, Jr., Signal Corps, Governors' Island, N. Y.

U. S. Navy—Lieut. Louis Dreller, Bureau

[1] An article giving the history of the development of the Electrical Standards Committee appeared on page 9 of the August, 1931, issue of the ASA BULLETIN.

of Engineering, Washington, D. C.; *Alternate*—J. B. Lunsford.

Bureau of Standards—E. C. Crittenden, Chief, Electrical Division, Bureau of Standards, Washington, D. C.; *Alternate*—Dr. J. F. Meyer, Physicist, Bureau of Standards, Washington, D. C.

It is expected that a joint meeting of the Electrical Standards Committee and the Electrical Advisory Committee will be held about the middle of October. This meeting will be the final meeting of the Electrical Advisory Committee and the organization meeting of the Electrical Standards Committee.

The Electrical Advisory Committee will take action on the report of a subcommittee which deals with the approval of a change in section 15 of the constitution for the ESC, which covers the international phases of the Electrical Standards Committee's activities. The Electrical Standards Committee will take the various steps necessary toward perfecting its organization; will take action on the personnels of two committees; and will consider five new projects submitted for its consideration by the American Institute of Electrical Engineers and a revision of an American Standard submitted by the American Institute of Electrical Engineers as sponsor.

Editorial Commends Electrical Standards Committee

The following editorial entitled "New Electrical Standards Committee Becomes International in Scope" is reprinted from the September 19, 1931, issue of the Electrical World:

Another step forward in the identification of national (United States) with international standards has been accomplished by the acceptance of the newly organized Electrical Standards Committee of the American Standards Association as the United States National Committee of the International Electrotechnical Commission. The idea of the new committee was initiated by the American Institute of Electrical Engineers early in 1930, and 18 months later it was received and approved by all parties in interest. As such matters go this is fast work, and those responsible for its forwarding are deserving of congratulation on their performance.

It is to be recognized that the difficulties attendant upon any standardization effort lie not alone in the normal tendencies of men to go different ways when they lack coordinated direction. There are also deliberate intentions of certain manufacturers who look through the spectacles of short-sighted selfishness and believe that their refusals to recognize proposed standards and their deviations from accepted ones will protect their markets. Happily for human progress in the material sense, this attitude is of much more seldom occurrence now than it was not so many years ago, and perhaps the instance of community of interest furnished by the present formation and future functioning of the Electrical Standards Committee indicates that such a feeling will be wholly non-existent tomorrow.

Aside from its significance as a working unit for the promotion of standardization in the domestic electrical field, the new committee represents a very worth-while contribution to the coordination of international and national standardization effort. The idea of a single group working in its own national field and being also the representative of international interest is an excellent one. It promises the avoidance of duplicated work, and it has the great virtue of retaining the same minds for dealing with both the domestic and the foreign aspects of a single problem.

Announce Changes in Standards Council Personnel

Changes in the personnel of the ASA Standards Council were reported at the meeting of the Council on September 10, as follows:

H. D. Reed, Bishop Wire and Cable Company, New York, formerly alternate, is now representative of the National Electrical Manufacturers Association in place of R. W. E. Moore. H. A. Calderwood, Electrical Engineer, National Metal Molding Division, Electrical Products Corporation, Pittsburgh, has been appointed alternate in place of Mr. Reed.

Admiral S. M. Robinson is representative of the U. S. Navy Department replacing H. E. Yarnell.

Standardization Project on Sieves for Testing Purposes Approved

The organization of a sectional committee to develop standard specifications for sieves for testing purposes (Z23) is now under way. The original request for the initiation of this project was received from the American Society for Testing Materials with the U. S. Bureau of Standards concurring. As a preliminary canvass of the major interests affected had indicated that the proposed project was acceptable, the ASA Standards Council at its meeting

on September 10 approved the initiation of the project and appointed the American Society for Testing Materials and the U. S. Bureau of Standards as joint sponsors.

If American Standards are formulated for testing sieves, they may well serve as a basis for later unification into an acceptable international sieve scale. The sectional committee when organized will represent American technologists and cooperate with the work of the ISA technical committee in this field. This ISA project—No. 24—has been under way for some time with the Polish national standardizing body acting as the secretariat.

Plan Revision of Standard for Coal Mine Tracks

The American Mining Congress, sponsor for the project Coal Mine Tracks, Signals, and Switches (M7a-1927) has recently announced that work on a revision of the standard approved in 1927 is actively under way. Plans have been perfected for further standardization and simplification of frogs and turnouts for coal mine tracks for both gathering and main line haulage ways. Final specifications should be available to the industry within a few months and should result in marked decreases of stocks of track materials carried on hand by manufacturers and coal-mining companies. In connection with this revision, consideration has also been given to the possible necessity of requesting amplification of certain sections of the standard specifications for Cross-Ties and Switch-Ties (O3-1926).

Excess Varieties Still Burden Industry

Boiled down to maximum economic concentration, standardization in engineering development means the elimination of excess varieties. Manufacturers are for it and operators of plants should be enthusiastic supporters of the process. Endless debate could be held over the definition of what an excess variety in electrical equipment design is, but the fundamental principle cannot be safely overlooked in future engineering. In a word, it is an economic crime to demand needless variety in apparatus built for utilitarian service, and the ultimate test is whether existing products can be counted upon to meet the problem in hand well enough to satisfy the reasonable requirements of leading professional and business judgment.

Departure from proved standards can no longer be justified on the grounds of individual pride in having something different or on the basis of technical whims. Only where the benefits of leaving the broad highway of swift and efficient manufacture and distribution are clearly defined and of due weight should there be a change of route to pioneering pathways. Research, development, and the cultivation of new markets will go on because the variety of human necessities is a dynamic movement and a challenge; but let there be an end of trivial modifications of first-class material to please somebody's ego.

There is room for diverse talents to find expression in satisfying both routine and special requirements. Routine needs, demanding standard designs and construction, will always employ the majority of men, and the elimination of excess varieties can never stop progress warranted by the creation of new necessities and opportunities. The final justification of the engineer's cost to society lies in his capacity to make the choice between the old and the new in equipment, materials, and methods, but today the presumption favors standardization, since by giving it weight often denied in the past costs can be reduced all around and earnings increased with resulting benefits to research as well as to consumers and investors—*Editorial from the June 27, 1931, issue of the Electrical World.*

Correction

In the July, 1931, issue of the ASA BULLETIN, page 24, the statement was made that tests on cast-iron pipe and fittings have been made in connection with the work of the Sectional Committee on Specifications for Drain Pipe and Special Castings (A21). The correct title of the project with which this committee is dealing is Specifications for Cast-Iron Pipe and Special Castings (A21). Drain or soil pipe was specifically excluded from the scope of the work, at least for the time being. The error in the above statement was, therefore, especially regrettable.

National Electrical Code Published

The National Electrical Code (C1-1931), approval of which was announced in the September issue of the ASA BULLETIN, has just been received from the printer. Copies are available for sale through the ASA office at five cents each. The code was prepared under the sponsorship of the National Fire Protection Association. It is published by the National Board of Fire Underwriters.

The Organization of Standardization Work in the Ingersoll-Rand Company[1]

by

Arthur Huntress, *Standards Department*
Ingersoll-Rand Company

Study of successful standardization programs results in elimination of unnecessary variations in products and plant procedures

The invitation to attend this meeting contained the suggestion that the speaker contribute to the exchange of experiences with a short discussion on the organization and administration of standards from the viewpoint of planning, of facilitating managerial control, and of operating economies.

The experience of our company, and of the speaker personally, in standardization in the modern meaning of the term is so short that nothing definite can be given except a brief description of conditions as they have been in the past and of our first real effort to achieve a genuine company standards system.

About two years ago the management of the plant, with which the speaker is connected, decided that our own standards needed readjustment for three main reasons: first, to bring them up-to-date in regard to commercial or national standards; second, to coordinate the standards in use in the various manufacturing divisions or departments of the plant; and third, to extend the standardization idea into fields as yet untouched by it.

This plant manufactures a considerable variety of products covering such widely differing articles as air compressors, rock drills, turbines, condensers, oil engines, centrifugal and piston pumps. In the course of years there have been added to the original organization whole plants or departments for the manufacture of new products. In some cases this was done by absorbing an already going plant with standards of its own. In others, the new division was built up within the old organization by hiring outstanding men with extensive knowledge of the particular product, buying patent rights, and developing the new department in that manner. In these latter instances the men in charge of the department have been allowed a large degree of autonomy.

Growth of this sort, which has been the story of many large companies, almost inevitably leads to difficulties in standardization. The natural result is duplication and multiplication of effort, lack of cooperation between departments, disregard of commercial or national standards, uneconomic use of materials, and a heterogeneous mass of standards. Most of the above evils can be greatly reduced, if not entirely done away with, as has been thoroughly demonstrated, by the intelligent application of the standardization idea.

It seems obvious that any real effort at standardization must begin with a comprehensive general plan of standardization. Then, there must be a central directive force to carry it out which must have the unswerving backing of the management.

The groundwork must consist in studying, first, your own conditions, and second, the basic ideas of successful plans already in operation. The publication of the National Industrial Conference Board entitled *Industrial Standardization* was of very great assistance to us in this preliminary work. From the suggestions given in this book and such other similar information as could be gathered, we have developed a plan for our own use which more nearly resembles the scheme of the Werner Plant of the Siemens and Halske Works (Berlin) than any other particular one considered.

Before proceeding with a brief description of our plan, it might be interesting to describe a few of the conditions we found in our own plant. During the three and one-half years preceding the initiation of the present work our warehouse office had from time to time brought out what were called stock lists which totaled

[1] This paper was part of the discussion of the paper, "The Fundamental Role of Standardization in the Operations of the Bell System," presented by Dr. H. S. Osborne at the September 10 meeting of the ASA Standards Council. An abstract of the remainder of the discussion will be found on pages 26 to 30.

40 at that time. Each list was confined to a single article such as machine bolts, or in a few cases, two or three closely allied articles such as brass and copper tubing. The object of these lists was to show what we actually carried in stock, what quantities we used, and approximately how fast the stock moved. These lists showed the large variety of materials carried which could properly be classed as common or standard stock, and disclosed the interesting fact that about 13,000 items were thus classified. These lists brought out sharply the tendency, previously known, toward constant extension of variety when little or no restraining influence exists to check it.

At another time, when we were working on the project of standardizing drawing forms and sizes, we discovered three different series of sizes in use in various departments, to say nothing of four or five odd sizes in use here and there. In the matter of steel filing-cabinets for drawings we found 13 different sizes of drawers. In the contact between the engineering departments and the shop we found a good system of blue-print distribution, control, and registration in one department, and an entirely different and less effective system in an adjacent department. Variations on the same theme could be repeated at length but are unnecessary. It is safe to say that the same conditions, varying only in degree, no doubt exist in scores of other plants today.

Norman F. Harriman in his book *Standards and Standardization* says:

> "Standardization may be defined as the unification of methods, practices, and technique involved in the manufacture, construction, and use of materials, machines, and products, in all lines of endeavor which present the necessity for performing repetition work."

We have attempted to develop our own plan in a manner which would provide a logical place and method of handling anything which is subject to standardization; such as, an article of stores, a manufacturing practice, an engineering or design method or practice, and shop or office routine and communication. In this plan we have divided the whole field within this company into six main divisions, or groups, which are designated by letters as follows:

G—General
E—Engineering
M—Materials, raw (such as metal bar stock)
C—Construction material, no labor required (such as bolts, nuts, pins, rivets, etc.)
T—Tools and gages
S—Outside standards

Under the G, or General Group, such subjects as Standardization Methods, Shop Organization, Business Routine and Communication, Business Forms, etc., are to be placed.

Under the E, or Engineering Group, such subjects as Drawings and Drafting Regulations, Calculation and Engineering Tables (mostly abstract or general) and Design Standards (mostly concrete or particular) are to be placed.

Each one of these lettered Groups is divided into numbered Classes, each covering a distinct subdivision; for instance, Group C—Construction Material, shows Class C2 as covering Bolts and Screws, Class C3 covering Studs, Class C4 covering Nuts, Class C5 for Wrenches, C6 for Washers, etc.

After it has been decided to standardize any particular thing and the Group and Class have been selected, a Sheet number is assigned. This Sheet number is placed before the Group and Class symbols in this manner, Sheet 20 C2, so that numbers and letters are automatically separated. This sheet number 20 does not mean page 20 but is only a division symbol. In other words, a Sheet may consist of anything from a fraction of a page to several pages. Sheet 20 C2 actually covers American Std.—Hex. Head—Natl. Course—Semi-Finished Machine Bolts and requires two pages. The advantage of this arrangement is that material can be added to a Sheet by adding more pages at any future time without disturbing the indexing in any way. Another way of looking at it is to say that any so-called Sheet could be built up by changes and additions into a pamphlet of as many pages as required to cover future needs.

The foregoing gives a sketchy description of the general plan we are working on. The following is a brief description of the method of putting it into effect.

A Standards Committee has been organized which consists of ten representatives of the various principal divisions and departments. This committee has the Assistant Chief Engineer for chairman. A secretary (who is a full-time man) makes the required preliminary investigation of a subject and prepares a proposed draft for a standard. This proposal is then submitted to the committee for study and discussion. If the subject is one which the regular Standards Committee believes requires special attention, it may place the question, either in whole or in part, in the hands of especially appointed subcommittees of engineers, chief tool designers, or similar groups. After developing the proposal to a completed tentative form, one further step is taken if the subject touches on commercial standards, and that is to submit the proofs to a number of repre-

sentative suppliers of the product for criticism, before final approval and printing.

About 18 months ago our company joined the American Standards Association as a Sustaining-Member and we have received much valuable assistance from the Association. During the past year these contacts have been made on only a very limited range of subjects, however, the principal ones being on Standards B18, Bolts and Nuts, and B16 on Pipe Flanges and Fittings. I would like to touch very briefly on some of our experiences in this connection.

The Standard B16e for high pressure and temperature steel pipe flanges and fittings, under the section on Bolting Material, page 4, appears to be ambiguous or contradictory in regard to material for nuts, as at the beginning of this paragraph it would appear to specify alloy steel nuts (at least for maximum service) and at a point further along distinctly calls for carbon steel nuts. We wrote the American Society of Mechanical Engineers for clarification on this point and received an acknowledgment of the apparent ambiguities existing. This was followed by the statement that it appeared to be the intention of the committee

> "to recognize the use of alloy steel for studs, nuts, and washers where the temperature was over 450 F and to permit the use of carbon steel nuts and washers for temperatures under 450 F."

The foreword to this standard states that before it was presented for approval it was passed by the unanimous vote of the sectional committee of 59 members representing 28 national organizations.

Proceeding on the assumption that this standard had been thoroughly thrashed out and that we had the correct interpretation of the only point which appeared doubtful, we provided on our new nut standard sheets for alloy steel material at temperatures above 450 F. When the proofs of these sheets were recently sent out to several of our main suppliers for comment we immediately began to receive criticism and protest on the provision of alloy steel for temperatures above 450 F.

It has since been determined, through other avenues of investigation, that alloy steel nuts are not considered good for this purpose due to a tendency to seize or gall and have practically never been used, and that the cyanided or case-hardened carbon steel nut which we had previously used is still considered good practice at temperatures between 450 and 750 F.

This means that our new nut standards, as first made, must be considerably revised before being issued.

The same standard, in Table 3, provides for three different classes of alloy steel bolting material which vary widely in physical characteristics. No specific recommendations whatever are to be found in the standard as to pressures or temperatures at which the various classes are believed to be most satisfactory. Correspondence with the A.S.T.M. in an effort to bring out some definite recommendations, or at least their views on the matter (as these are A.S.T.M. specifications), has also failed to bring any definite results.

The point of these remarks is that there appears to be room for improvement in the actual drafting of a standard after the controversial points have been settled.

Contacts with Outside Bodies

Under the heading "Cooperation with Outside Standardizing Bodies" Dr. Osborne lists six organizations in addition to ASA with which the Bell System must deal.

In our own recent experience we have received questionnaires or correspondence on the same identical subject from the American Society of Mechanical Engineers, the Society of Automotive Engineers, the Diesel Engine Manufacturers Association, etc. It would seem possible and highly desirable to eliminate this duplication of effort by the use of master mailing lists for conducting the work of any sectional committee. In this manner the contact between the sectional committee and individual companies could be divided among the sponsors according to the principal interests of the companies involved and the contact confined to one point.

On page 29 of the ASA BULLETIN for August, there is a note to the effect that a certain American Standard has been reprinted by the sponsor, with changes which have not been approved by ASA. Such incidents are to be regretted, in the opinion of the speaker, as being of a nature which does not help to build up a strong central body.

In conclusion, quoting from *Industrial Standardization*, page 101, we find this statement in regard to ASA:

> "In America the object of the central organization is to provide a *procedure* by which national standards may be established. In other countries the central standards body deals with all aspects of producing and promulgating standards."

Satisfactory procedure is certainly important but the main fact, not to be lost sight of, is that from the user's viewpoint the object finally attained (in this case the standard) is of the greatest importance. For this reason we believe in a stronger and better central organization for producing national standards—the American Standards Association.

Abstract of Discussion of Osborne Paper on Standardization in the Bell System

The following abstract is taken from the discussion of the paper "The Fundamental Role of Standardization in the Operations of the Bell System," presented by Dr. H. S. Osborne at the September 10 meeting of the ASA Standards Council. "The Organization of Standardization Work in the Ingersoll-Rand Company," pages 23 to 25 of this issue, was also a part of the discussion.

A. L. STADERMANN:[1] As a representative of the independent telephone group in this country, I can assure you that I am very much interested in this paper, both personally and from the association standpoint. The telephone system in this country is served from two groups: the Bell group representing 20,000,000 stations, and the independent group representing 5,000,000 stations. I happen to be the plant chairman of the association representing the 5,000,000. It is my great pleasure to try to help to coordinate the telephone systems so that, instead of being two groups, they are really one system. It doesn't make any difference to a subscriber to a water system, a gas system, or an electric light system what the practices of the other system are; it doesn't affect his lighting service or water or gas service; but it does make a very decided difference to a telephone subscriber what the standards are of either one or the other system. Therefore, it has been our effort as the independent association to coordinate our practices with the Bell practices and at all times to work in harmony.

HARRY E. HARRIS:[2] I want to try to bring out a few points that show what standardization meant to the Western Electric Company. I first went with them in '99, and I was with them until 1911. I was one of their first tool designers. When I went there in 1899, they were getting out 8000 telephones a week, but they had to get out more to meet the demands of the operating companies.

In the assembling department, in '99, they were turning out about nine units per employee. They hadn't really started to standardize. They started just about the beginning of this century. In 1904, they were turning out 71 units per employee, and that was practically the result of standardization—standardization throughout the shop, in the assembling department, and in their tool methods. With less than half the number of employees in the assembling department, they turned out three times as many units, or sextupled the output.

The processes in the shop gradually became systematized and standardized so that the assembly foreman, instead of carrying the whole burden of ordering parts from the different departments in the shop himself, had them come to him in proper schedule so that the parts he wanted first got to him first. All mechanical work, filing, fitting, reaming, and so forth, was absolutely taken out of the assembly. Parts were manufactured and inspected by standard routine and schedule, so that they were in the assembling department ready to put together without any delay.

In 1911 we used a box with 24 compartments containing the adjusting screws for adjusting the platinum button bar on the old Edison transmitter. The assembler would pick up a screw and try it in the hole; if it was too loose, he would drop it over with the small-size screws. The screws were all supposed to be the same size. Then he would pick from the different compartments, and he might have to pick 30 screws before he would get one which would have a fit that wouldn't shift.

Out of the standardization work on screws at the Western Electric Company developed the A.S.M.E. standard. The A.S.M.E. standard machine screw was taken almost bodily from the research work done at the Western Electric Company.

H. P. CHARLESWORTH:[3] Not only do we find in standardization the direct advantages which are so well recognized, but we also find in it very great collateral advantages of benefit and inspiration to personnel concerned in development and other work. We find that our development work is greatly facilitated by standardization and that it brings very definite aids to progress, rather than stagnation.

J. C. IRWIN:[4] I think the Bell Telephone Company has reached an enviable position in connection with standardization and simplification.

There are two points in Mr. Osborne's remarks that stand out in my mind. One is the

[1] Citizens Independent Telephone Company, Terre Haute, Ind.

[2] Consulting Engineer, Harris Engineering Company, Bridgeport, Conn.

[3] Vice-President, Bell Telephone Laboratories, New York, N. Y.

[4] Valuation Engineer, Boston and Albany Railroad, Boston, Mass.

value of simplification by the reduction in the number of types so that any one type will be used in much larger numbers, tending toward economy in production. The other is the fact that a standard can remain a standard only so long as it is the best practice in the light of present knowledge. If a standard is to be changed, however, it should not be changed on the whim of an individual. It is important that any changes should be fully considered in the sectional committee and in the American Standards Association before they are adopted or used by any one. It is most important that the men in sectional committees be carefully selected and that they give their full interest to the committee's work so that we will know that there is no rubber-stamping among the members of the committee who produce the standard which is put before us to recommend.

JOHN A. CAPP:[5] Aside from its intrinsic interest as showing the thoroughness with which one industry has gone into standardization, Mr. Osborne's paper serves a very useful purpose in that it shows the complexity of standardization in any large industry. There must be standardization in the manufacturing end, which means the tools and the parts used in manufacturing, aside from raw material. There must be standardization in the raw material itself. There must be standardization of design, of output. The important thing is that there are so many different groups of people—shopmen, engineers, salesmen—not always closely associated, which are involved in standardization.

But effective standardization requires some means of tying in all these interests, which may otherwise become almost antagonistic rather than cooperative. If that is true in an individual industry, how much more true it is when you come to standardization among industries, either allied, competitive, or completely unrelated, except as they may use common things. It means that you have got to learn how to cooperate.

CHARLES R. HARTE:[6] The Bell Telephone System is entirely self-contained. One group within the system manufactures the products which another group uses. In that fact lies a control over standardization that is wanting in a great many other fields.

Take the case of practically any widely used manufactured product handled by a very large number of independent groups. The manufacturing in almost every instance is done by a large number of small concerns utterly unable to effect economies achieved by the big manufacturers, and depending entirely for their standing on some peculiarity in their product. You have there one of the very difficult problems in securing universal standardization in any line you choose, unless you have a completely self-contained group.

That is where ASA comes in so effectively through its sectional committees. If, as should be the case, minor groups have secured representation, there is an opportunity to set the standardization lines wide enough so that a considerable measure of variation is permissible within limits, limits which fix the essential points, but do not bind too closely. Except as that is done, it seems to me we are going to have a good deal of difficulty in getting any extensive standardization movement outside of certain special materials.

It is one thing for one or two executives to say that a standard has passed its usefulness and must now be set aside, and another thing to ask perhaps 2000 or 3000 members of a group, "What are you going to do about this? We think it might be changed."

I think the movement that we are now inaugurating in ASA—forming the interested groups into sections, such as the Electrical Standards Committee, now almost operative, and the similar groups which I think unquestionably will come in other divisions—is bound to bring a closer contact with those industries coming under the jurisdiction of the various groups. Whatever is done, it will be a long time, except in very exceptional cases, before we can draw the standardization lines as closely as the Bell Telephone Group has done. Until we can do that, of course, we cannot reap any such benefit as has been reaped by Bell.

P. G. AGNEW:[7] I wonder if Dr. Osborne wouldn't be good enough to say a few words about the committee or organization or administrative set-up used in bringing about their decisions within the system, with reference to standardization.

H. S. OSBORNE:[8] Mr. Agnew's question is a difficult question to answer for the simple reason that the machinery of establishing a standard is so different in different situations. I might take the case of a new type of apparatus which has been developed by the Bell Telephone Laboratories in consultation with the general departments of the American Telephone and Telegraph Company. When that apparatus has been proved to be suitable by a trial installation under practical operating conditions and is approved by the two or three departments directly concerned, it is designated as standard

[5] Chief of Testing Laboratory, General Electric Company, Schenectady, N. Y.

[6] Construction Engineer, The Connecticut Company, New Haven, Conn.

[7] Secretary, American Standards Association, New York, N. Y.

[8] Transmission Engineer, American Telephone and Telegraph Company, New York, N. Y.

in a catalog which is distributed by the Western Electric Company with a card for each type of apparatus. It is marked "A.T.&T. Standard." The American Telephone Company transmits information regarding the new standard to all the operating parts of the System with the information regarding its field of use. The Bell Telephone Laboratories transmit the specification for the new piece of apparatus to the Western Electric Company. The Western Electric Company then in their own branches develop the standard tools and standard processes of manufacture by which they will make the apparatus in accordance with that specification.

P. G. AGNEW: What is the committee organization or administrative set-up for arriving at the decision that there shall be a new standard, particularly a standard which affects the operating company, the manufacturing company, and the research laboratories?

H. S. OSBORNE: There is no specific machinery set aside for arriving at that decision, but such decisions form a very important part of the work of all departments of the system and particularly of the general departments. A new standard which affects the operating companies in an important way, before being promulgated by the general departments of the American Telephone and Telegraph Company, is very often the subject of conference between them and the people who have to use them. Of course, by the organization of the Bell System the men in the general departments are in constant touch in any event with the operating departments and it is their business to know the needs and the requirements of those departments. But on top of that it is a very common practice to consult with those most interested in an important new standard and then it is issued as a part of the regular job of the laboratories and the general departments in the way which I have mentioned. In other words, we don't have a small group who are set aside with the job to create standards or to designate things as standards.

W. F. DIXON:[9] I would like to ask Mr. Osborne whether there isn't some one man who puts his final seal of approval on the proposed standard. A bill in the legislature cannot go into effect until the Governor has affixed his signature. Isn't there somebody or some group in your organization which functions as the Governor does in the state and says, "This is to be the standard?"

H. S. OSBORNE: The responsibility for determining what is to be standardized is handled in the same way as the responsibility for all other decisions relating to the business of the Bell System. The work of the Bell System is functionalized, different companies and different departments within a company having definite responsibilities. A consideration of the multifarious character of the standardizing work of the system makes it clear that no general standardizing body could advantageously be set up to pass upon all of these different kinds of standards. As a general rule it is not found necessary to supplement the regular organization by standardizing committees cutting across organization lines, although to a limited extent, for specific purposes, such committees are established. In the main then it can be said that the establishment of standards is an inbred part of the job of all individuals and groups having responsibility for management decisions and for investigations and research.

A. L. STADERMANN: We have been singing the praises of what has been done. I want to raise a howl about what is not being done. I am coming to my pet hobby and that is trimmed paper sizes. We all admit that it is one of the most important standards there is. Everybody sends paper to everybody else, and we all have our troubles nearly every day as to what we are going to do with the paper and how we are to handle it.

Isn't it time we wake up before the printing presses deluge us with unstandard sizes which we cannot handle in a standard manner? We are not consistent. We ought to begin with fundamentals. The most common apparatus used is a sheet of paper. It may be standardized in your company and it won't be in somebody else's. An internal standard in your company becomes external when you put it in the mail and send it to somebody else. I think it is time for us to give this serious consideration.

We start from the stock sizes of the papermaker. We have cut these sizes up into fractions and they are our trimmed sizes. They have no relation to our files, or binders. It seems to me that we ought to be consistent in our work and give this serious thought. I realize the difficulty of it. The problem during my lifetime may not be finished, and I am not so very old, either, but we ought to have it started.

F. O. HOAGLAND:[10] I think this question is very pertinent and I think just a word now ought to be said as to what is the proper size of a letterhead. It is $8\frac{1}{2} \times 11$.

A. L. STADERMANN: That isn't correct with the railroads and isn't correct for the General Electric Company. It is correct for the Bell Telephone System, but when the Bell Telephone System sends a letter to the General Electric or the American Railway Association they must

[9] Works Manager, Singer Manufacturing Company, Elizabethport, N. J.

[10] Pratt and Whitney Company, Hartford, Conn.

put it in their binders. It is oversized for them. The 8 × 10½ of the railroads, General Electric, and Government will fit the Bell System and my system. My system won't fit the other fellow's. When it comes to a ring binder—goodnight! Yet it is possible to have ring binders designed so that they will be absolutely universal by using four rings. You can put in any size. Now you get 8½ × 11 binders and they are just good for that size. If you get a half sheet, that takes a different kind of spacing. Why should it be so? Why not put a half sheet in with a whole sheet and a quarter sheet with a half and a whole? It can be done. As a hobby, I have worked it out, but you can't get it across. The manufacturers are not interested. I don't understand the psychology of the thing at all.

L. T. ROBINSON:[11] It seems to me, in standardization of the kind being talked about, that you are inclined to do so much you don't get anywhere with it. One discussor here asked what was the size of our letterhead. That is only one little thing, and they haven't got the answer. There is a simpler one than that—what size would this association recommend for the publication of standards? And we can't get the answer to that. If this committee which was so ambitious to reform the world would do one simple little thing and say that this association recommends a certain size for standards published by sponsors and others who publish standards, without trying to force anybody to do it, just set that up and say that we think it is right, that it represents the best collective thought, if they had done that five years ago, I think they would be so far on their way that they would have no reason to complain about the hard-hearted public that won't listen to what they want to have done.

A. L. STADERMANN: The reason for the lack of success of the committee was simply this: if you are going to standardize something, you have got to be sure it is going to be adopted, and you must not feel that perhaps later on it will be changed again. I personally was in favor of not doing anything until we could build from the ground up. You cannot build a firm structure on sand. Until you can get a national standard assembled, I for one haven't the courage to ask anybody to change, because five years from now he may be asked to change again. Let's do nothing until we get started right with assurance that the standard will be national.

S. L. NICHOLSON:[12] I have listened with a great deal of interest to this standardization discussion, particularly in connection with the Bell System. I wonder, however, where the Bell System would be today if they had to get the approval of their consumers, 11,000,000 of them, or at least an appreciable majority of them.

There are certain types of standardization that are perfectly possible and feasible for the making of American Standards. For other types it is almost impossible, or at least quite improbable, that any national standardization could be done for many, many years. For instance, let's take a certain matter in which I was vitally interested; namely, the question of having motor dimension standards approved by the American Standards Association. There are 40 to 60 customers on the sectional committee. After you get them to adopt the standards, then let's see you get the standards changed. There are very few, if any, of those customers who would be willing to make a change without a long period of controversy and consideration. In the meantime the industry does more or less stagnate.

Therefore, it seems to me that whenever you come in contact with a customer, not only of the type I mention, but also the average customer who buys merchandise, you cannot get them to standardize.

The question of paper sizes could be standardized perhaps in industry by common consent, but I would like to see you get the women to agree on a uniform standard for their notepaper sizes. Women do not buy entirely by quality. They buy by finish and because it is different from what somebody else has.

In considering standardization we must consider which types of standardization are feasible for American Standards Association approval and which ones are not. I think that question will need to be very carefully worked over by the Association and by its directors before we proceed on any standardization which may prove uneconomical and of a great disadvantage to those adopting the standards at a later date.

I wanted to express this particularly in connection with paper sizes and with our own troubles, which most of you know about. You can't get your customers to agree. Even though you may get them once, when you come to make the change they won't agree because they don't want to change their machine tool designs.

WILLIAM J. SERRILL:[13] Mr. Osborne, in describing how standards are made in his company, has said that different departments and different operating companies over the country are in certain cases consulted. I

[11] Engineer, General Electric Company, Schenectady, N. Y.

[12] Westinghouse Electric and Manufacturing Company, New York, N. Y.

[13] United Gas Improvement Company, Philadelphia, Pa.

would like to inquire whether the consultation is done by mail or whether in most cases the representatives from those departments actually meet in committees.

H. S. OSBORNE: There again the procedure is very various. We have no set procedure for the establishment of standards. The purpose is to insure that there is a consensus of view on the part of those involved, that the new standard represents the thing to do. So that we have occasions where there are groups of representatives of different operating companies who gather together, and other cases which are handled by correspondence.

W. F. DIXON: Just how is the need for a new standard determined; that is, how does it come about that somebody in your organization starts research work on a particular problem, and who decides, and how, whether that research work shall be conducted?

H. S. OSBORNE: Since standardization is handled along regular organization lines, this question can be answered only by a specific illustration. One very important type of standardization activity is the standardization of new types of apparatus and telephone systems, and I should like to ask Mr. Charlesworth if he will outline as an illustration the method of deciding upon the necessity for new standards of this type.

H. P. CHARLESWORTH: We have at 195 Broadway a department known as the Department of Development and Research, whose duty it is to study into the future and determine what new types of telephone apparatus and equipment the system requires through its own knowledge and through its contact with the Operation and Engineering Department and with the operating companies. That department is devoting its time to looking into the future as to the requirements of the System. When it sees a time has come for a change of standards or for new standards, it works out those requirements, in cooperation with the operating companies and the other departments at 195, and then they are in turn referred to the Bell Telephone Laboratories for development. Perhaps we are a little different in some ways from some smaller companies, in that we have a department whose sole function, almost, is to be looking into the future and to be studying the requirements and the fundamental future program of research. That is where the new development usually starts. In some cases the development may originate in the laboratories and go through much the same cycle of consideration. In some cases it may start in one of the other general departments of the A.T.&T. Company or in the field. Some operating company may have a need on their own behalf or on behalf of their customers for a new system or a new arrangement, a new service, and that, of course, comes to the headquarters and then is studied both as to the specific case and as to the possibility of its general application.

ALICE L. EDWARDS:[14] To cite the attitude of consumers toward some of these questions of standardization, I have been thinking of the agitation stirred up by some of the housewives who have been receiving from commercial houses and other sources so many folders, publicity sheets, and information sheets which they have considered valuable. They felt they were being wasteful in throwing those things away. But they could not make proper use of them, because they were so varied in size. They asked if there might not be a conference to discuss the simplification of the sizes of this educational material, so-called, that is being put out by various and sundry firms.

There was a small meeting, at which there were representatives of a number of firms which put out material of that kind.

The meeting failed of any accomplishment because the various firms that were preparing material couldn't agree on any sizes that were satisfactory.

I receive in our office from convention bureaus and hotels a great deal of publicity material in connection with our organization's annual meeting. The usual rather elaborate form that comes in is too large for the letter-size folders in our files. Consequently, I toss it into the waste-paper basket in a very large number of cases.

WORTH ROGERS:[15] I am very much interested in the remarks made about the futility of endeavoring to arrive at and promulgate standards which we know in advance are not going to be adopted. In our own association work that has been one of the evils. A committee is appointed or a section is organized to do certain standardization work and everybody has a pet idea that certain problems that confront him individually should be standardized and through courtesy one to the other they sometimes put on their standardization program a long list of items for which there is perhaps no real need for standardization, and also perhaps are impossible to standardize, at least at the time. The result is a dispersion of effort.

One of the things I try to do in my capacity in the Association is to arrive at a list of projects in connection with which we have some

[14] Executive Secretary, American Home Economics Association, Washington, D. C.

[15] Operating Division, American Railway Association, St. Louis, Mo.

reasonable hope of standardizing and getting the standards used.

I think a standard that is not used or a standard that is only used by a small percentage of the people interested, and objected to by the remaining percentage, is worse than useless. It is a detriment to the work we are engaged in.

I think the one most important thing we can do to start with is to pick out a few standards, subjects for standardization that we know can be standardized, do a thoroughly good job on those, and thereby get our reputation solidly established, and it will be easier then as time passes to take up the more difficult, more complicated problems.

Standardization Important in Electrical Industry

"New and better engineering" in the central station industry, stimulated by the business depression, has included the development of standardization and mass production as one of its most important features, according to an article "Engineering Follows New Trends" in the May 30 issue (N.E.L.A. Convention Number) of the *Electrical World*.

The extent to which standardization enters into the problems of the industry may be judged from a list of five objectives which, the article states, utility engineers have attempted to bring about by applying engineering analysis. These objectives are:

1. A reduction in the number of system voltages
2. A greater use of a unit assembly of standard equipment for each functional duty
3. An improved use of existing structures and equipments
4. A reduction in numbers and type of apparatus through simplification and standardization
5. A planned program for system growth

Standardization enters directly into three of these objectives and is equally important, though less directly, in the other two; namely, improved use of existing structures and equipment, and a planned program for system growth.

The progress of engineering thought, from the standardization of minor details to the standardization of complete assemblies wherever it is both desirable and economically advantageous, is typified in a discussion of substation construction.

"Substation art and practice," it says, "is becoming more standardized through the application of the principle that a substation is a functional installation—an assembly of apparatus to step up or step down voltage or to perform switching operation between systems or loads. Instead of detail design and construction, attempts are being made to have standard factory-built assemblies that may be placed above or below ground. This assembly is based on oil or compound sheet steel fabrication and complete metal inclosure of all equipment needed to perform the substation function. Meters, relays, transformer, voltage regulator,and oil breakers are put together as a unit assembly in a factory. This leads to lower costs, the use of standard equipment, the elimination of specially designed buildings and individual apparatus. The 4000-volt, 1500-kva network type of substation is an example of this trend, as are the steel-oil-filled substations used by the Public Service Company of Northern Illinois and other utilities.

"This class of substation is economical and practical for voltages below 66 kv, but for higher voltages the structural air-insulated outdoor substation seems to be more economical and practical. This type of substation, however, is also getting more standardized as to design and as to apparatus used."

Simple Performance Tests Described in New Book

A Laboratory Course in Everyday Physics by Carleton John Lynde, Ph.D. (MacMillan Company) $1.00.

Some Sustaining-Members interested in the production and operation of household appliances will wish to examine this book, which is supplementary to Dr. Lynde's *Everyday Physics* used at Teachers College, Columbia University. A large part of the work is devoted to elementary experiments in mechanics, heat, electricity and magnetism, light and sound; and the closing pages deal with various simple tests on mechanical appliances. Vacuum cleaners are tested for friction in the operating mechanism and for efficiency in dirt removal. Simple tests are shown for adjusting gas, electric, and oil ranges, and also for determining capacity and cost of operation of various burners. Adjustment and accuracy tests are outlined for gas-oven thermostats. Material is also given on methods of testing performance of ice, electric, gas, and oil refrigerators. Other

subjects treated are temperature range and heat distribution in an electric iron, and performance tests of electric toasters and of an electric percolator.

A.S.T.M Committee Studies Corrosion of Iron

There has been considerable interest aroused in the corrosion-resisting properties of malleable iron, especially for overhead trolley construction. Committee A-7 on Malleable Castings, of the American Society for Testing Materials, has a subcommittee which is now working on this problem.

The chairman of Committee A-7, W. P. Putnam, President of the Detroit Testing Laboratory, has been authorized to initiate an investigation of the embrittlement of malleable iron castings which are used in the galvanizing process. A subcommittee will probably be formed to make a critical study of this phenomenon.

A.S.T.M. Committee B-3 on Corrosion of Non-Ferrous Metals and Alloys has sponsored the preparation and distribution of 16,000 specimens of many different materials. These will be exposed in nine outdoor test locations and in four different liquid immersion test locations for exposure tests. All specimens have now been placed on the racks at the following test sites:

	Test Sites	*Types of Atmosphere*
1.	Pittsburgh, Pa.	Industrial
2.	Altoona, Pa.	Industrial
3.	State College, Pa.	Rural
4.	New York City	Combination of semi-industrial and partial seacoast exposures
5.	Sandy Hook, N. J.	Northern seacoast
6.	Rochester, N. Y.	High humidity, light industrial
7.	Key West, Fla.	Southern seacoast
8.	Phoenix, Ariz.	Dry inland
9.	San Diego (La Jolla), Calif.	High humidity, seacoast

The committee plans to review data which was obtained on accelerated corrosion tests and to write recommended practice instructions for total immersion, alternate immersion, spray and accelerated electrolytic tests together with a critical review of each. These data, once they are published, should be of great value to the industries whose products are affected by corrosive action.

Information obtained from the proposed embrittlement and exposure tests will be available to the ASA sectional committee on Specifications for Zinc Coating of Iron and Steel (G8), under the sponsorship of the American Society for Testing Materials.

Pennsylvania Specifications Available

The American Standards Association has recently received copies of the following specifications from the Department of Property and Supplies, Bureau of Standards and Purchases, State of Pennsylvania: apple butter, beef (prepared), canned fruits, canned vegetables, chili and Worcestershire sauces, jellies, marmalade, olives, pickles (cucumber, mixed), preserves (fresh fruit), tomato catsup.

Sustaining-Members interested in specifications for foodstuffs may obtain copies of these specifications through the ASA office.

Czechoslovakia Standardizes School Apparatus

Standardization of laboratory apparatus and other equipment used in schools in Czechoslovakia will eliminate the major difficulties of replacement even in small and badly equipped schools, it is believed by the Ministry of Education in Czechoslovakia, according to an article in the May 22 issue of the *Central European Observer*, Prague. A committee on standardization of school apparatus, which is studying methods for the simplification of the technical equipment of schools, has been set up at the Ministry of Education. The article says:

> "The chief interest of the committee centers around the question of producing each apparatus and other parts of the laboratory equipment in only one type and to manufacture such instruments as to make possible their frequent combination. Similarly, all parts of the apparatus are being standardized so that their replacement does not constitute a problem, no matter how small or badly equipped the school may be. Complete plans for furnishing the physical, biological, and chemical laboratories of primary, secondary, and high schools have been dealt with by the committee. The next stage of its work is to meet the manufacturers and negotiate with them for the minimum price at which the committee's designs can be produced."

Fourdrinier Wire Cloth Standard

The Commercial Standard for Fourdrinier Wire Cloth, which has been developed by the U. S. Bureau of Standards, has been approved. The standard is effective for new production on November 1, 1931, and for clearance of existing stock on May 1, 1932, according to an announcement from the Bureau of Standards.